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(19) **United States**(12) **Patent Application Publication**  
**BIELAS**(10) **Pub. No.: US 2021/0340619 A1**(43) **Pub. Date: Nov. 4, 2021**(54) **COMPOSITIONS AND METHODS FOR  
ACCURATELY IDENTIFYING MUTATIONS**(71) Applicant: **Fred Hutchinson Cancer Research  
Center, Seattle, WA (US)**(72) Inventor: **Jason H. BIELAS, Seattle, WA (US)**(21) Appl. No.: **17/374,917**(22) Filed: **Jul. 13, 2021****Related U.S. Application Data**

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(57)

**ABSTRACT**

The present disclosure provides compositions and methods for accurately detecting mutations by uniquely tagging double stranded nucleic acid molecules with dual cyphers such that sequence data obtained from a sense strand can be linked to sequence data obtained from an anti-sense strand when sequenced, for example, by massively parallel sequencing methods.

**Specification includes a Sequence Listing.**